UNITED STATES DEPARTMENT OF AGRICULTURE

FOOD DISTRIBUTION ADMINISTRATION

METHODS EMPLOYED IN THE LABORATORY ANALYSIS OF EVAPORATED MILK

BY THE

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OF

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THE CHEMICAL ANALYSES OF EVAPORATED MILK

Evaporated milk is analyzed in the F.D.A. laboratory with a Mojonnier Tester using methods which are essentially the same as those recommended by the Mojonnier Bros. in their Manual.

Determination of Net Weights

A composite representing 2000 cases is made up as follows:

The odd-numbered cans of milk are weighed to an accuracy of 0.01 ounce; these cans are then opened, poured into an adequate container and poured back and forth at least four times using another similar sized container. One ounce of the well mixed sample is taken for testing and the remainder of the milk is discarded. The empty cans are washed in plain tap water without soap, dried and reweighed to obtain the net weight. If the average weight of the odd-numbered cans is less than 14.50 ounces, the even-numbered cans are also weighed. It is observed that only half of the cans are originally used; in the event of the milk being below standard in fat or solids, the remaining cans may be employed to determine which of the individual lots did not meet specifications.

Solids Determination

Pipette 1.0 gm of the well mixed evaporated milk into a previously tared covered dish. Add 1 ml. of distilled water and shake dish to evenly distribute the milk-water mixture. Place dish on hot plate 185° C, carefully evaporate the mixture to a light shade of tan. Transfer dish to the "solids oven" at 100° C, heating for 20 minutes with not less than 24" vacuum. Place in desiccator for 10 minutes, reweigh and calculate as percentage of total solids in the sample.

Butterfat Determination

Transfer approximately 5.0 gms of the well mixed composite of evaporated milk into a Mojonnier extraction flask (using weighing pipettes and holder). Add 5 ml. of distilled water, mix by shaking, and then add 1.5 ml. of concentrated ammonium hydroxide (28%) and again mix contents. 10 ml. of 95 ethyl alcohol are now added to the flask and again the flask is well shaken. To the treated sample in the extraction tube add 25 ml. of ethyl ether and mix by shaking for at least 30 seconds. Next add 25 ml. of petroleum ether and thoroughly shake for 30 seconds. With a hand centrifuge rotate the flask 30 turns in 30 seconds. Decant the clear ether layer into a weighed aluminum dish and evaporate the ether slowly on a hot plate (135° C.).

Repeat the above extractions using 5 c.c. of ethyl alcohol instead of 10 c.c. as for the original extraction. The quantities of both ethyl and petroleum ether for the second extraction are as previously described. Again centrifuge the mixture 30 turns in a hand centrifuge for 30 seconds. Distilled water is added to raise the level to the top of the lower neck of the flask.

Place on 135° C hot plate and carefully evaporate the ether. The dishes are then placed in the vacuum oven with at least 24 inches vacuum at 135° C for 5 minutes. Cool for 7 minutes in Mojonnier Desiccator, weigh and report as percent fat.